AMENDMENTS TO THE CLAIMS

1. (currently amended): A data storage system comprising:

a first data storage device comprising a first data storage device memory for holding data;

a second data storage device comprising:

> a second data storage device volatile memory;

> a second data storage device non-volatile memory; ~~and~~

> a processor for causing a copy of data provided to said first data storage device to be provided to said second data storage device volatile memory, and in the event of a power interruption moving said data from said second data storage device volatile memory to said second data storage device non-volatile memory; and

> a secondary power source comprising a capacitor for providing power to transfer data from said second data storage device volatile memory to said second data storage device non-volatile memory.

2. (original): The data storage system, as claimed in claim 1, wherein said first data storage device comprises at least one hard disk drive.

3. (original): The data storage system, as claimed in claim 1, wherein said first data storage device comprises a plurality of hard disk drives.

4. (currently amended): The data storage system, as claimed in claim 1, wherein said first data storage device memory comprises a volatile write-back cache and a storage media capable of storing said data.

5. (original): The data storage system, as claimed in claim 4, wherein said first data storage device, upon receiving data to be stored on said storage media, stores said data in said volatile write-back cache and generates an indication that said data has been stored at said first data storage device before storing said data on said media.

6. (canceled):

7. (canceled):

8. (currently amended): The data storage system, as claimed in claim [[6]]1, wherein said secondary power source comprises a battery.

9. (currently amended): The data storage system, as claimed in claim [[6]]1, wherein said second data storage device, upon detection of a power interruption, switches to said secondary power source and receives power from said secondary power source while moving said data from said second data storage device volatile memory to said second data storage device non-volatile memory.

10. (original): The data storage system, as claimed in claim 9, wherein upon completion of moving said data from said second data storage device volatile memory to said second data storage device non-volatile memory, said second data storage device discontinues receiving power from said secondary power source.

11. (original): The data storage system, as claimed in claim 1, wherein said second data storage device non-volatile memory comprises an electrically erasable programmable read-only-memory.

12. (original): The data storage system, as claimed in claim 11, wherein said second data storage device volatile memory comprises a random access memory.

13. (original): The data storage system, as claimed in claim 1, wherein said processor, upon detection of a power interruption, reads said data from said second data storage device volatile memory, writes said data to said second data storage device non-volatile memory, and verifies that said data stored in said second data storage device non-volatile memory is correct.

14. (original): The data storage system, as claimed in claim 13, wherein said processor verifies that said data stored in said second data storage device non-volatile memory is correct by comparing said data from said second data storage device non-volatile memory with said data from said second data storage device volatile memory, and re-writing said data to said second data storage device non-volatile memory when the comparison indicates that the data is not the same.

15. (original): The data storage system, as claimed in claim 1, wherein said processor, upon detection of a power interruption, reads said data from said second data storage device volatile memory, computes an ECC for said data, and writes said data and said ECC to said second data storage device non-volatile memory.

16. (original): The data storage system, as claimed in claim 1, wherein said first data storage device and said second data storage device are operably interconnected to a storage server, said storage server operable to cause data to be provided to each of said first and second data storage devices.

17. (original): The data storage system, as claimed in claim 16, wherein said storage server comprises a storage server CPU.

18. (original): The data storage system, as claimed in claim 17, wherein said storage server is capable of:

receiving block data to be written to said first data storage device, said block data comprising unique block addresses within said first data storage device and data to be stored at said unique block addresses;

storing said block data in said second data storage device;

manipulating said block data, based on said unique block addresses, to enhance the efficiency of said first data storage device when said first data storage device stores said block data to said first data storage device memory; and

issuing one or more write commands to said first data storage device to write said block data to said first data storage device memory.

19. (original): The data storage system, as claimed in claim 18, wherein said manipulating said block data comprises reordering said block data based on said unique block addresses such that seek time within said first data storage device is reduced.

20. (original): The data storage system, as claimed in claim 1, wherein said processor, following restoration of power after the power interruption, moves said data from said second data storage device non-volatile memory to said second data storage device volatile memory.

21. (original): The data storage system, as claimed in claim 20, wherein said processor upon detection of the power restoration, reads said data from said second data storage device non-volatile memory, computes an ECC for said data, and compares said ECC to a stored ECC read from said second data storage device non-volatile memory.

22. (original): A data storage system, comprising:

a block data storage device capable of storing block data to a first memory;

a backup memory device comprising a backup non-volatile memory; and

a block data storage processor interconnected to said block data storage device and said backup memory device, that is capable of:

receiving block data to be written to said block data storage device, said block data comprising unique block addresses within said first memory and data to be stored at said unique block addresses;

storing said block data in said backup memory device;

manipulating said block data, based on said unique block addresses, to enhance the efficiency of said block data storage device when the block data storage device stores said block data to said first memory; and

issuing one or more write commands to said block data storage device to write said block data to said first memory.

23. (original): The data storage system, as claimed in claim 22, wherein said block data storage device memory comprises a volatile write-back cache and a storage media capable storing said data.

24. (original): The data storage system, as claimed in claim 23, wherein said block data storage device, upon receiving data to be stored on said storage media, stores said data in said volatile write-back cache and reports to said block data storage controller that said data has been stored at said block data storage device before storing said data on said storage media.

25. (original): The data storage system, as claimed in claim 22, wherein said backup memory device further comprises a backup volatile memory and a backup power source

26. (original): The data storage system, as claimed in claim 25, wherein said backup power sources comprises a capacitor.

27. (currently amended): The data storage system, as claimed in claim 25, wherein said backup power source comprises a battery.

28. (currently amended): The data storage system, as claimed in claim 25, wherein said backup memory device, upon detection of a power interruption, switches to said backup power source and receives power from said backup power source and moves said data from said backup volatile memory to said backup non-volatile memory.

29. (original): The data storage system, as claimed in claim 28, wherein said backup memory device, upon detection of a power interruption, reads said data from said backup volatile memory, writes said data to said backup non-volatile memory, and verifies that said data stored in said backup non-volatile memory is correct.

30. (original): The data storage system, as claimed in claim 28, wherein said backup memory device, upon detection of a power interruption, reads said data from said backup volatile memory, computes an ECC for said data, and writes said data and said ECC to said backup non-volatile memory.

31. (original): The data storage system, as claimed in claim 30, wherein said backup memory device upon detection of power restoration following the power interruption, said data is moved from said backup non-volatile memory to said backup volatile memory.

32. (original): The data storage system, as claimed in claim 31, wherein said backup memory device reads data from said backup non-volatile memory, computes an ECC for said data, compares said computed ECC to said ECC written to said backup non-volatile memory, and writes said data to said data to said volatile memory.

33. (original): The data storage system, as claimed in claim 31, wherein said block data storage device comprises a plurality of hard disk drives, and

wherein said block data storage processor is further capable to write an identifier to each of said hard disk drives identifying said backup memory device, and

wherein said block data storage processor verifies that said identifier is present on each of said hard disk drives following the power restoration.

34. (original): The data storage system, as claimed in claim 22, wherein said manipulating said block data comprises reordering said block data based on said unique block addresses such that seek time within said block data storage device is reduced.

35. (currently amended): A method for storing data in a data storage system, comprising:

providing a first data storage device comprising a first memory for holding data;

providing a second data storage device comprising a second volatile memory and a second non-volatile memory and a second power source comprising a capacitor for providing power to transfer data from said second volatile memory to said second non-volatile memory;

storing said data to be stored at said first data storage device at said second data storage device in said second volatile memory; and

moving, using power provided by said capacitor, said data from said second volatile memory to said second non-volatile memory in the event of a power interruption.

36. (original): The method, as claimed in claim 35, wherein said first data storage device comprises at least one hard disk drive.

37. (original): The method, as claimed in claim 35, wherein said first data storage device memory comprises a volatile write-back cache and a storage media capable storing said data.

38. (original): The method, as claimed in claim 37, wherein said first data storage device, upon receiving data to be stored on said storage media, stores said data in said volatile write-back cache and generates an indication that said data has been stored at said first data storage device before storing said data on said media.

39. (canceled):

40. (canceled):

41. (currently amended): The method, as claimed in claim [[39]]1, wherein said secondary power source comprises a battery.

42. (currently amended): The method, as claimed in claim [[39]]1, wherein said moving step comprises:
    switching said second memory device to said secondary power source;
    reading said data from said second data storage device volatile memory; and
    writing said data to said second data storage device non-volatile memory.

43. (original): The method, as claimed in claim 42, wherein said moving step further comprises:

switching said second memory device off of said secondary power source following said writing step.

44. (original): The method, as claimed in claim 35, wherein said moving step comprises:

detecting a power interruption;

reading said data from said second data storage device volatile memory;

writing said data to said second data storage device non-volatile memory; and

verifying that said data stored in said second data storage device non-volatile memory is correct.

45. (original): The method, as claimed in claim 44, wherein said verifying step comprises:

comparing said data from said second data storage device non-volatile memory with said data from said second data storage device volatile memory; and

re-writing said data to said second data storage device non-volatile memory when said comparing step indicates that the data is not the same.

46. (original): The method, as claimed in claim 35, wherein said moving step comprises:

detecting a power interruption;

reading said data from said second data storage device volatile memory;

computing an ECC for said data; and

writing said data and said ECC to said second data storage device non-volatile memory.

47. (original): The method, as claimed in claim 35, further comprising:

providing a block data storage controller operably interconnected to said first and second data storage devices.

48. (original):   The method, as claimed in claim 47, wherein said block data storage controller comprises an operating system and a block storage processor that is capable of:

receiving block data to be written to said first data storage device, said block data comprising unique block addresses within said first data storage device and data to be stored at said unique block addresses;

storing said block data in said second data storage device;

manipulating said block data, based on said unique block addresses, to enhance the efficiency of said first data storage device when said first data storage device stores said block data to said first data storage device memory; and

issuing one or more write commands to said first data storage device to write said block data to said first data storage device memory.

49. (original):   The method, as claimed in claim 48, wherein said manipulating said block data comprises reordering said block data based on said unique block addresses such that seek time within said first data storage device is reduced.

50. (original):   The method, as claimed in claim 35, further comprising:

detecting a power restoration after the power interruption; and

secondly moving said data from said second non-volatile memory to said second volatile memory.

51. (original):   The method, as claimed in claim 50, wherein said secondly moving step comprises:

reading said data from said second data storage device non-volatile memory;

computing an ECC for said data;

comparing said ECC to stored ECC stored at said second data storage device non-volatile memory; and

writing said data to said second data storage device volatile memory when said comparing step indicates said ECC and stored ECC are the same, and generating an error when said comparing step indicates said ECC and stored ECC are not the same.

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52. (original): The method, as claimed in claim 50, wherein said step of providing a first data storage device comprises providing a plurality of data storage devices each having an identification stored thereon identifying said second data storage device, and wherein the method further comprises:

writing said data stored at said second data storage device volatile memory to said hard disk drives when said identification is present on all of said hard disk drives, and

generating an error when said identification is not present on all of said hard disk drives.

53. (currently amended): A data storage system comprising:

a primary data storage device comprising a primary memory for holding data;

a backup data storage device comprising:

a backup volatile memory,

a backup non-volatile memory,

a backup power source comprising a capacitor for providing power to transfer data from said backup volatile memory to said backup non-volatile memory, and

a processor operable to:

cause a copy of data provided to said primary data storage device to be provided to said backup volatile memory; and

upon detection of a power interruption, move said data from said backup volatile memory to said backup non-volatile memory and verify the accuracy of the data stored in said backup non-volatile memory using power supplied by said capacitor of said backup power source.

54. (original): The data storage system, as claimed in claim 53, wherein said primary data storage device comprises at least one hard disk drive.

55. (original): The data storage system, as claimed in claim 53, wherein said primary data storage device memory comprises a volatile write-back cache and a storage media capable storing said data.

56. (original): The data storage system, as claimed in claim 55, wherein said primary data storage device, upon receiving data to be stored on said storage media, stores said data in said volatile write-back cache and generates an indication that said data has been stored at said primary data storage device before storing said data on said media.

57. (canceled):

58. (original): The data storage system, as claimed in claim 53, wherein said backup data storage device non-volatile memory comprises an electrically erasable programmable read-only-memory, and said backup data storage device volatile memory comprises a random access memory.

59. (original): The data storage device, as claimed in claim 53, wherein said processor verifies that said data stored in said backup data storage device non-volatile memory is correct by comparing said data from said backup data storage device non-volatile memory with said data from said backup data storage device volatile memory, and re-writing said data to said backup data storage device non-volatile memory when the comparison indicates that the data is not the same.

60. (original): The data storage system, as claimed in claim 53, wherein said processor, upon detection of a power interruption, reads said data from said backup data storage device volatile memory, computes an ECC for said data, and writes said data and said ECC to said backup data storage device non-volatile memory.

61. (original): The data storage system, as claimed in claim 53, wherein said primary data storage device and said backup data storage device are operably interconnected to a block data storage server, said storage server operable to cause data to be provided to each of said primary and backup data storage devices.

62. (original): The data storage device, as claimed in claim 61, wherein said block data storage server comprises an operating system and a block storage processor that is capable of:

receiving block data to be written to said primary data storage device, said block data comprising unique block addresses within said primary data storage device and data to be stored at said unique block addresses;

storing said block data in said second data storage device;

manipulating said block data, based on said unique block addresses, to enhance the efficiency of said primary data storage device when said primary data storage device stores said block data to said primary data storage device memory; and

issuing one or more write commands to said primary data storage device to write said block data to said primary data storage device memory.

63. (original): The data storage device, as claimed in claim 62, wherein said manipulating said block data comprises reordering said block data based on said unique block addresses such that seek time within said primary data storage device is reduced.